

WHAT IS CLAIMED IS:

1. A method for managing locomotives in a railyard including a parking yard and a service yard, based on possible future states of the parking yard and the service yard, using a system including a computer, said method comprising the steps of:

5 enumerating possible present locomotive placement options;

enumerating possible future railyard states arising from each possible present locomotive placement option;

examining each possible future railyard state; and

10 choosing a present option based on the examination of the possible future railyard states.

2. A method in accordance with Claim 1 wherein said step of enumerating possible present locomotive placement options comprises the steps of:

evaluating a geometry of the parking yard; and

evaluating a geometry of the service yard.

15 3. A method in accordance with Claim 1 wherein said step of enumerating possible present locomotive placement options further comprises the step of establishing an initial state of the railyard.

4. A method in accordance with Claim 3 wherein said step of establishing an initial railyard state comprises the steps of:

20 evaluating a present locomotive configuration of the parking yard; and

evaluating a present locomotive configuration of the service yard.

5. A method in accordance with Claim 3 wherein said step of enumerating possible future railyard states comprises the steps of:

evaluating the initial railyard state; and

25 evaluating a yard schedule.

6. A method in accordance with Claim 5 wherein said step of evaluating a yard schedule comprises the steps of:

evaluating an inbound locomotive schedule; and

evaluating an outbound locomotive schedule.

5 7. A method in accordance with Claim 6 wherein said step of evaluating a yard schedule further comprises the steps of:

evaluating service requirements of inbound locomotives;

evaluating a list of locomotive service types provided in the service yard; and

evaluating non-standard movements of locomotives within the railyard.

8. A method in accordance with Claim 1 wherein said step of examining each possible future railyard state comprises the steps of:

examining a cost of each possible future state; and

examining a time based efficiency of each possible state.

9. A method in accordance with Claim 8 wherein said step of examining a cost of each possible future state comprises the steps of:

examining costs incurred from delays to the outbound locomotive schedule caused by the service requirements;

examining costs incurred in performing non-standard movements;

20 examining costs incurred by schedule delays caused by non-standard movements; and

examining costs incurred by late departure of a locomotive.

10. A method in accordance with Claim 8 wherein said step of examining a time based efficiency of each possible state comprises the steps of:

25 examining delays to an outbound locomotive schedule caused by the service requirements; and

examining delays caused by non-standard movements.

11. A method in accordance with Claim 1 wherein said step of choosing a present option comprises the step of executing a locomotive management algorithm utilizing the computer.

5 12. A method in accordance with Claim 11 wherein said step of executing a locomotive management algorithm comprises the steps of:

applying a set of yard management objectives;

applying a set of parking yard management rules; and

applying a set of service yard management rules.

10 13. A method in accordance with Claim 12 wherein said step of applying a set of yard management objectives comprises the steps of:

assembling an outbound locomotive consist as scheduled;

delivering an outbound locomotive consist as scheduled;

15 reducing a total labor usage figure for labor involved in assembling and delivering an outbound locomotive consist;

reducing delays in locomotive servicing; and

comparing the cost of late locomotive consist departure to additional labor costs needed to assemble and deliver an outbound locomotive consist as scheduled.

20 14. A method in accordance with Claim 12 wherein said step of applying a set of parking yard management rules comprises the steps of:

executing locomotive pull-forwards when there is a reduced number of locomotives on an affected parking track;

25 maintaining an order of locomotives on each parking track such that locomotives for later outbound locomotive consists are parked behind locomotives for earlier outbound locomotive consists; and

parking a lead locomotive for an outbound locomotive consist on a parking track such that the lead locomotive is in front of other locomotives parked on the same track that are allocated for the same outbound locomotive consist.

5 15. A method in accordance with Claim 12 wherein said step of applying a set of service yard management rules comprises the steps of:

positioning a locomotive in a queue for service on a lead-in track to a service bay that provides the appropriate service;

10 16. positioning locomotives in a queue on a lead-in track in an order that allows servicing of each locomotive to be completed before each locomotive is scheduled for assembly in an outbound locomotive consist; and

 scheduling short service activities before long service activities when scheduling conflicts are not at issue.

15 16. A networked system for managing locomotives in a railyard including a parking yard and a service yard, based on possible future states of the parking yard and the service yard, said system comprising:

 a client system comprising a browser;

 a database for storing information;

 a server system coupled to said client system and said database, said server system configured to:

20 20. enumerate possible present locomotive placement options;

 enumerate possible future railyard states arising from each possible present locomotive placement option;

 examine each possible future railyard state; and

25 25. determine a present option based on the examination of the possible future railyard states.

 17. A networked system in accordance with Claim 16 wherein to enumerate possible present locomotive placement options said server system further configured to:

evaluate a geometry of the parking yard; and

evaluate a geometry of the service yard.

18. A networked system in accordance with Claim 16 wherein to enumerate possible present locomotive placement options said server system further configured to establish an initial state of the railyard.

19. A networked system in accordance with Claim 18 wherein to establish an initial railyard state said server system further configured to:

evaluate a present locomotive configuration of the parking yard; and

evaluate a present locomotive configuration of the service yard.

20. A networked system in accordance with Claim 18 wherein to enumerate possible future railyard states said server system further configured to:

evaluate the initial railyard state; and

evaluate a yard schedule.

21. A networked system in accordance with Claim 20 wherein to evaluate a yard schedule said server system further configured to:

evaluate an inbound locomotive schedule; and

evaluate an outbound locomotive schedule.

22. A networked system in accordance with Claim 21 wherein to evaluate a yard schedule said server system further configured to:

evaluate service requirements of inbound locomotives;

evaluate a list of locomotive service types provided in the service yard;
and

evaluate non-standard movements of locomotive within the railyard.

23. A networked system in accordance with Claim 16 wherein to examine each possible future railyard state said server system further configured to:

examine a cost of each possible future state; and
examine a time based efficiency of each possible state.

24. A networked system in accordance with Claim 23 wherein to examine a cost of each possible future state said server system further configured to:

5 examine a cost of delays to the outbound locomotive schedule caused by the service requirements; and

examine a cost of non-standard movements.

10 25. A networked system in accordance with Claim 23 wherein to examine a time based efficiency of each possible state said server system further configured to:

15 examine costs incurred from delays to the outbound locomotive schedule caused by the service requirements;

examine costs incurred in performing non-standard movements;

20 examine costs incurred by schedule delays caused by non-standard movements; and

examine costs incurred by late departure of a locomotive.

25 26. A networked system in accordance with Claim 16 further configured to execute a locomotive management algorithm by:

applying a set of yard management objectives;

20 applying a set of parking yard management rules; and

applying a set of service yard management rules.

25 27. A networked system in accordance with Claim 26 wherein to apply a set of yard management objectives said server system further configured to:

assemble an outbound locomotive consist as scheduled;

20 deliver an outbound locomotive consist as scheduled;

reduce a total labor usage figure for labor involved in assembling and delivering a locomotive consist;

reduce delays in locomotive servicing; and

5 compare the cost of late locomotive consist departure to additional labor costs needed to assemble and deliver an outbound locomotive consist as scheduled.

28. A networked system in accordance with Claim 26 wherein to apply a set of parking yard management rules said server system further configured to:

10 execute locomotives pull-forwards when there is a reduced number of locomotives on an affected parking track;

maintain an order of locomotives on each parking track such that locomotives for later outbound locomotive consists are parked behind locomotives for earlier outbound locomotive consists; and

15 park a lead locomotive for an outbound locomotive consist on a parking track such that the lead locomotive is in front of other locomotives parked on the same track that are allocated for the same outbound locomotive consist.

29. A networked system in accordance with Claim 26 wherein to apply a set of service yard management rules said server system further configured to:

20 position a locomotive in a queue for service on a lead-in track to a service bay that provides the appropriate service;

position locomotives in a queue on a lead-in track in an order that allows servicing of each locomotive to be completed before each locomotive is scheduled for assembly in an outbound locomotive consist; and

25 schedule short service activities before long service activities when scheduling conflicts are not at issue.

30. A networked system according to Claim 16 wherein the client system and the server system are connected via a networked and wherein the network is one of a wide area network, a local area network, and an Intranet and the Internet

31. A networked system according to Claim 16 wherein said server system is further configured with a displaying component for displaying various user interfaces to the user, a receiving component for receiving an inquiry to provide information from one of a plurality of users, a collection component for collecting information from users into the centralized database, a tracking component for tracking information on an on-going basis, and an accessing component for accessing the centralized database and causing the retrieved information to be displayed on the client system.

10 32. A networked system according to Claim 31 wherein said server system further configured with a processing component for searching and processing received inquiries against the data storage device containing a variety of information collected by the collection component.

33. A networked system according to Claim 31 wherein said server system further configured with a retrieving component to retrieve information from the data storage device.